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TWO HISTORIES OF CHEMISTRY.

A History of Chemistry from Earliest Times to the Present Day. By Ernst von Meyer. Translated by George McGowan. Third English edition, translated from the third German edition, with various additions and alterations. Pp. xxvii+691. (London: Macmillan and Co., Ltd.) Price 17s. net.

A History of Chemistry. By F. P. Armitage. Pp. xx+266. (London: Longmans, Green and Co., 1906.) Price 6s.

PROF. OSTWALD, who has done so much for the historical side of the literature of chemistry, has declared that "there is no more effective means of vivifying and deepening the study of a science than to saturate one's-self in its history." And perhaps of no science can this be more emphatically said than of chemistry. The story of its rise and development is one of the most astonishing and most deeply interesting chapters in the history of human progress. No one science can show such a splendid succession of material triumphs, or afford a more striking exemplification of the truth and wisdom of Bacon's aphorism that *Scientia est potentia*. It matters little that the desire to know may have had its origin in the lowest motives of self-interest. No doubt at all times in the history of the world there have been persons curious to know for the mere sake of knowing—persons, indeed, who deliberately preferred the risk of the possible unhappiness of wisdom to the apparently certain bliss of ignorance—but such persons have always been in a vast minority. But in the main the springs of human activity—intellectual no less than physical—have their origin in an enlightened self-interest. However "pure" a science may be to its votaries, there is a good deal of human nature in it after all, and when we come down to ultimate causes it is precisely this aspect of the matter that gives to the history of chemistry its strong human interest, and makes the personal story of its cultivators so fascinating.

Teachers of chemistry do wisely, therefore, in encouraging their pupils to make themselves familiar with the main outlines of the origin and growth of their science; and since it is impossible to separate this development from the human element which underlies it, to seek also to know something of the personal history and attributes of the men who have combined to make chemistry what it is. Luckily they have not far to seek for historical compilations worthy to be recommended for such a purpose. Practically every nation that zealously cultivates chemistry has furnished its contribution to the general stock of such compilations in obedience to, or in anticipation of, a demand which from the very nature of the case is inevitable. To a large extent the several histories may be said to reflect the popular estimation of the

science in the countries which produced them. The monumental work of Kopp made its appearance at the period of, and possibly in consequence of, the national movement which originated with Liebig; and Höfer's "*Histoire de la Chimie*" was in like manner the probable outcome of the activity in France which had its rise with Lavoisier. No original systematic work of the same character, certainly none of commensurate importance, has been put together by any English historian. Certain of our larger manuals contain, by way of introduction, some historical account of the origin and development of the science, and a few monographs or biographies of the better known British chemists have appeared from time to time, but as regards systematic works we are dependent upon translations of foreign treatises.

Chief among these is the work of Ernst von Meyer, which made its first appearance in 1888, and of which an English translation by Dr. McGowan was published in 1891. The volume before us is the third English edition. It has been prepared from the third German edition, published in 1904, and, thanks to the various additions and alterations which Dr. McGowan has introduced with the sanction of the author, the history is, as the phrase goes, thoroughly up to date. The main divisions of the work remain very much as before, but some of the sections have been recast and much new matter has been added and old matter altered. For example, the author has not failed to take note of the results of recent inquiries into the life and work of that most remarkable man Paracelsus, who, as the researches of Mook, Schubert, Sudhoff, Aberle, and Strunz agree in showing, was by no means the bombastic charlatan he is commonly supposed to be. The mystery of Basil Valentine is submitted to a new examination, but the conclusion does not materially differ from that already arrived at by Kopp. But it is mainly in its account of the recent development of the science that the book differs from the works of Kopp and Höfer. Kopp, in his "*Entwicklung der Chemie in der neueren Zeit*," only carried his history down to the beginning of the last third of the nineteenth century—a time we can no longer consider new—and the generation that has followed has witnessed an astonishing expansion both in fundamental facts and in important and far-reaching dogmas, and it is in this period that the student of to-day probably finds his chief interest. Dr. von Meyer has himself lived through it, and he writes with a full and accurate knowledge of its achievements, and in the spirit of detachment, of impartiality and insight which characterise the true historian. The work is a perfect treasure-house in its wealth of bibliographical and biographical detail. Its literary charm lies in the simplicity and directness of its style, characteristics which Dr. McGowan has well preserved in his admirable rendering into English. We commend the work to all students of chemistry in the certain conviction that they will rise from its perusal with their interest in the science—to use Ostwald's words again—vivified and deepened.

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The work of Mr. Armitage is of a different order, and, to the extent that it is original, is, we regret to say, a very immature production. It shows few traces of independent inquiry, but is obviously based in large measure on that of von Meyer, and in general treatment follows that work pretty closely. Now and again, however, Mr. Armitage seeks to be original rather in mode of expression than in the compilation of facts, but he only succeeds in being obscure, and his attempts at epigram and "fine writing" usually end in bathos. What, for example, is the precise meaning and value of the statement, "Even during that stage of transition which separated him from the brute creation, man must have appreciated the beneficial or harmful effect of many naturally occurring substances"? Quite true, no doubt, but the brute creation itself with equal certainty had this degree of appreciation of what was beneficial or harmful. But Mr. Armitage argues that in this appreciation we had the dawn of chemistry! What, too, is meant by saying that "Aristotle maintained the four elements earth, air, fire and water." Of the philosopher's stone it is said, "But it was not till later that its full powers, transmuting and medicinal, obtained recognition." Considering that the philosopher's stone was a myth, could its full powers ever obtain recognition? Again, "the sulphurous smell observed on the calcination of tin was very cogent evidence of the presence of sulphur." Is it quite certain that there is a sulphurous odour when tin is calcined? What, too, is meant by saying, "Hoffmann's attitude was not, however, maintained by any attempt at practical verification, and was, moreover, devoid of the unifying intent of Stahl"? Of Priestley and Cavendish it is said, "Their outward circumstances were as diverse as their inner consciousness." This is said of Lavoisier:—"The way of progress had been groped for long, the times were ripe for its discovery, and Lavoisier was their chosen agent."

We further read of Lavoisier:—"Complete success had awarded his efforts; and the weapons he had forged, of homage to experimental fact and scepticism of so-called established truths, were become the common property of scientific men."

Of Vauquelin we read:—"His work on the separation of the rare metals platinum, palladium, rhodium, indium, and osmium shows us how far the horizon had receded." The horizon must have receded very far indeed if it included indium in the time of Vauquelin. It has hitherto been supposed that indium was not discovered until 1863.

With respect to the attitude of Berzelius towards Dalton's hypothesis we read:—"Berzelius, in reviewing the whole subject, became oppressed with the unscientific slapdash manner in which it has been approached by his contemporaries." This is precisely the feeling with which we review Mr. Armitage's book; on reading it we too are oppressed with the unscientific slapdash manner in which the author has approached the whole subject of the history of chemistry.

MONASTICISM.

Essays upon the History of Meaux Abbey and Some Principles of Mediaeval Land Tenure. Based upon a Consideration of the Latin Chronicles of Meaux (A.D. 1150-1400.) By Rev. A. Earle. Pp. 192. (Hull and London: Brown and Sons, Ltd., 1906.)

THE author of this volume is, we apprehend, a curate of Nafferton-with-Wansford, in Yorkshire, who, having obtained an exhibition at St. John's College, Cambridge, for ecclesiastical history, has not neglected the subject in which he obtained distinction. We welcome all such additions to the skeleton army of genuine students of antiquity, but Mr. Earle has his spurs to win and his authority to establish, for it is not to be assumed that he learnt much about monastic chartularies and chronicles at Cambridge. We make this preliminary remark because Mr. Earle has not fortified his observations by marginal references to authority; he has written no preface, and has supplied no index. We presume these essays are intended for his neighbours, and are the result of notes for lectures on the subject of an interesting abbey to the chapter of which the author's church belonged.

The book is in two parts, the former containing eight chapters on the origin of the abbey and its influence on the surrounding country as imagined by the author, the latter containing six chapters on principles of land tenure. The essays are stated to be based on "a consideration of the Latin Chronicles of Meaux, 1150-1400, and in the margins are placed dates which are references to volume and page of the Chronicles as published by the Record Office." We presume the Master of the Rolls' series is meant. Having ascertained the scheme of the book we sought for a preface, in order to learn whether the author made an independent study of the chronicles and whether the observations and reasoning are his own. But there is no preface, and we are thus unable to satisfy a reasonable curiosity. The fact is that the Master of the Rolls published the chronicles of Melsa, or Meaux, in three large octavo volumes, 1866-8, the editor being Edward Bond, keeper of the manuscripts in the British Museum, and to each volume Mr. Bond contributed a long and very learned preface. Mr. Earle ought surely to have explained whether his interesting narrative is or is not entirely derived from Mr. Bond. In the absence of such explanation we must presume that it is, and we regard the volume before us as an excellent abstract of three long treatises by a learned author. We have, after much consideration, concluded that Mr. Earle's work, easy of perusal and rather colloquial in style, presents a fairly accurate picture of human society in Holderness, as affected by one of many great institutions, religious in their origin, but commercial in practice.

The abbey was founded by William le Gros, Earl of Albemarle, Lord of Holderness, in the year 1150, as the condition of being released from a vow to make a pilgrimage to Jerusalem. The monk who influenced the earl was Adam, of the Cistercian Abbey of Fountains, who had much to do with the foundation of that